

# American Cinematographer

*Published by the American Society of Cinematographers, Inc.*



## **In this Issue:**

**Projection—By Earl J. Denison**

**Photographing in Alaska—By Charles G.  
Clarke, A. S. C.**

**Rack Marks and Airbell Markings on Motion  
Picture Film—By J. I. Crabtree and C.  
E. Ives.**

PUBLISHED IN HOLLYWOOD CALIFORNIA

# RELEASES

October 4, 1925, to November 15, 1925

## TITLE

## PHOTOGRAPHED BY

The Primrose Path  
The Timber Wolf  
Easy Going Gordon  
Law or Loyalty  
Without Mercy  
Three Wise Crooks  
A Son of His Father  
The Fear Fighter  
Wandering Fires  
What Fools Men  
A Daughter of the Sioux  
Classified  
The Calgary Stampede  
The Dark Angel  
The Midshipman  
The True North  
Paint and Powder  
Lovers in Quarantine  
Thunder Mountain  
A Regular Fellow  
Lazybones  
Exchange of Wives  
Crack o' Dawn  
The Substitute Wife  
The Pace That Thrills  
Some Fun'kins  
The Pride of the Force  
Sealed Lips  
American Pluck  
Ridin' the Wind  
9 3-5 Seconds

Children of the Whirlwind  
The Winding Stair  
Little Annie Rooney  
Barriers Aflame  
His Master's Voice  
Flower of Night  
Red Hot Tires  
The Unwritten Law  
Scandal Street  
Thank You

Satan in Sabies  
Durand of the Bad Lands  
The Unnamed Woman  
The Everlasting Whisper  
Hidden Loot  
The Wall Street Whiz

A Little Girl in a Big City  
The Live Wire

The King on Main Street  
East Lynae

Andre Barlatier  
Allen Davey  
Not credited  
Not credited  
Chas. G. Clarke, member A. S. C.  
Roy Klaffki  
Not credited  
Rosa Fisher, member A. S. C.  
Harry Stradling  
Norbert Brodin, member A. S. C.  
Wm. Fildew, member A. S. C.  
Hal Rosson  
Harry Neuman  
George Barnes, member A. S. C.  
Oliver Marsh  
W. W. Kelly  
Sol Polito, member A. S. C.  
J. Roy Hunt  
Glen McWilliams  
Charles Boyle  
Geo. Schneiderman, member A.S.C.  
Ben Reynolds  
Lee Garmes  
Harry Stradling  
T. D. McFord, member A. S. C.  
Phillip Tannura and James Brown  
Not credited  
Sam Landers, member A. S. C.  
H. Lyman Broening, member A.S.C.  
Rosa Fisher, member A. S. C.  
Gordon B. Pollock and Edward  
Henderson

Edward Paul  
Karl Struss  
Charles Rosher, member A. S. C.  
Robert Kurrie, member A. S. C.  
Jack MacKenzie  
Bert Glennon, member A. S. C.  
Charles Van Enger, member A. S. C.  
Frank Good, member A. S. C.  
Edwin Paul  
George Schneiderman, member A.  
S. C.

John Mescall  
Allen Davey  
Not credited.  
Daniel B. Clark, member A. S. C.  
Wm. Nobles  
William Marshall, member A. S. C.  
and Jack Stevens  
C. J. Davis and Jack Young  
Charles Gibson, John Geisel and  
Paul Strand  
James Howe  
Ernest Palmer, member A. S. C.

# American Cinematographer

FOURTH GOSS, *Editor and Business Manager*

J. W. PATRICK, *Managing Editor*

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# PROJECTION • Conducted by Earl J. Denison

## Splicing of Film Requires Great Care

(This paper was presented before the recent meeting of the Society of Motion Picture Engineers.)

During the past ten years the mechanical processes involved in the making of motion pictures have—for the most part—been subjected to critical analyses followed by changes and improvements which have resulted in increased efficiency.

Processes of major importance—the perfection of the film; the taking of the pictures; and the making of positive prints—are now carried on by means of standardized machines and instruments, the use of which insures surpassingly fine artistic effects joined with a minimum of production cost.

### Scant Attention

But some minor processes are of major importance and these have received scant attention. The splicing of film is a case in point. This process has—until recently—been carried on by crude methods which have produced unsatisfactory results. A faulty splice may throw the picture out of frame, trespass upon the picture space, stiffen the film at point of splice, or give way altogether. And to the extent that it does any of these things it makes impossible the production of the perfect motion picture.

A more intimate knowledge of motion picture film, the use it is subjected to in the theatres, together with the science and reasons for prop-

er inspection, splicing and handling will lead those engaged in this particular branch of the industry to an understanding and appreciation of the necessity for perfect work.

### Perfection

Of primary importance among the mechanical processes is that of film perforation, as accuracy in this operation is the first requisite in the making of quality pictures; i. e., being the initial operation, successful handling of the succeeding processes is only possible with the utmost accuracy in film perforation.

The fact that the life of the film depends almost entirely on the physical and mechanical conditions of the perforations (Sprocket Holes) proves that the utmost care should be exercised to prevent the perforations from becoming damaged.

The matter of splices has never been confined to any one locality, but constitutes a problem for all laboratories, exchanges and the theatres.

This problem presents features more complicated than the mere holding quality of the splice, and the recurrence of complaints shows clearly that a satisfactory means of splicing film to withstand the use to which the prints are subjected in the theatres has yet to be standardized.

There is very little difference in uniformity, flatness, register, etc. It is an easy

## Careless Workmanship

Brings Heavy Loss to  
Theatre and Producer

matter to obtain strength, but strength alone does not constitute a satisfactory splice.

### Ultimate Test

Projection is the ultimate test for the mechanical and physical qualities of the splice, as well as the film, and while practically all film damage occurs in the theatres, about 50% of the damage is traceable to improperly made splices for which there are six primary causes.

Cause No. 1. *Splice out of register* (of sprocket holes not perfectly matched.) Splices of this kind will jump while passing through the projector and probably damage the film.

Cause No. 2. *Splices too wide*. A splice is stiff and unbending, and if too wide will not seat properly on the sprocket wheels of the projector, causing a jump with probably damage.

Cause No. 3. *Emulsion or gelatin not entirely removed*. Due to the fact that film cement only acts upon the celluloid base of the film, it is necessary to entirely remove the emulsion in making the splice. Where there is a particle of emulsion, the cement will not hold, causing the splice to open and come apart.

Cause No. 4. *Too much or too strong a cement*. We say "splicing" the film, when it is more nearly correct to say "welding" the film. The cement attacks the celluloid base of the film and when the

(Continued on Page 18)

## Photographing in Alaska

By Chas. G. Clarke, A. S. C.

A. S. C. Member Leads  
Pioneer Studio Filming  
Trip to Far North



Filming Scenes for "Rocking Moon," at Ancient Glacier North of Juneau, Alaska. Chas. Clarke, A. S. C., Second from Left.

Unique in the history of motion picture making was the trip of sixteen players of the Metropolitan Picture Corporation to Alaska for the filming of "Rocking Moon," the novel by Barrett Wiloughby. The picture was directed by George Melford and the scenes were taken in and around Sitka, the old Russian capitol, which still has many of the original Russian buildings and totem poles erected hundreds of years ago.

### Pioneer Trip

While it is true that many scenic and educational films have been taken in Alaska, the trip of the Metropolitan players is said to have been the first into the far frozen north country for the express purpose of filming a play because of the tremendous expense involved due to uncertain weather and transporta-

tion conditions. However, the Metropolitan took this chance and arrived in Juneau, Alaska, in seven days. From

Juneau the trip was made to Sitka in a very small boat.

### Citizens Co-operate

In the latter city the weather was a great surprise, for instead of terrific cold, real Hollywood weather was encountered — warm days with mellow sunlight and sufficiently long in duration to enable the company to take far more scenes than had first been supposed. Citizens of the town gave a willing hand in obtaining special "props" and authentic costumes and were most obliging to assist in any way needed.

### Fox Farming

The story of "Rocking Moon" is built around the important industry of fox farming in Alaska and the story derives its name from the shape of the island where the majority of the foxes are raised. Most of the action takes place on this island.

The government leases

(Continued on Page 24)



George Melford, Rockliffe Fellows and Lillian Jackson With Some of the Blue Foxes Which Clarke Photographed.

## Arrange Release for Cowling Films



Famous Subjects Cut  
and Edited; Ready Now  
for Immediate Showing

Announcement was made this month of the release through which the motion pictures, made by Herford Tynes Cowling, A. S. C., in his latest trip around the world, will be distributed to cinema patrons. Entire distribution rights to all the motion pictures filmed by Cowling under the "Round the World Travel Picture" banner have been purchased by Pinellas Films, Inc., of which Harry P. Carver is president.

### *Three of Feature Length*

There will be three of Cowling's releases in feature length—"A Lion Hunt in Africa," "A Tiger Hunt in India," and "Into Unknown Tibet; or Tibet, the Unknown Empire." The matter on which these three productions are based formed the foundation for three successive stories which appeared under the A. S. C. member's authorship in this publication.

The single reel subjects, which Cowling made on the same trip, will be distributed by Pinellas through the Short Film Syndicate, New York, of which Hal Hodes is president. Included are more than 100 short reel subjects of the adventure type, which are a distinct departure from the stereotyped "travel" pictures.

"The name of the travel picture," the A. S. C. member states, "has become synonymous with subjects made along the beaten path of the tourist, and at the same time has come to be applied to all pictures so made abroad."

### *Real Adventure*

The accepted phraseology, it is said, does not accurately describe the motion pictures which Cowling has brought back from his memorable trip. The A. S. C. member prefers to refer to his productions as something of the adventure type, going as he did farther and farther afield each year for his material.

"Some of the series will be called 'Far Eastern Trails,'" Cowling continued, "while the films of a fish fight in Siam; the birthday of the King of Bunyoro in Africa; or the wed-

ding ceremony of the Raja of Kashmir are neither travel pictures nor adventure pictures—it is just letting one-half of the world see what the other half is doing, and letting that other half see such as a matter of entertainment rather than education.

### *Difficult Field*

"It becomes more and more difficult every year to find subjects that will entertain. With such wonderful and magnificent productions for imaginative entertainment as 'The Thief of Bagdad,' 'The Wanderer' or 'Don Q'—which build, for example, such elaborate sets as for 'Bagdad'—any films I would make of the real Bagdad or Mesopotamia, or of the Arabian or Persian people, would appear squalid and unromantic beside the productions made in Hollywood from fiction rather than from fact.

"However, our business is one essentially of imaginative entertainment. I certainly have no complaint to make on that score. But I do regret to see the feature pictures becoming longer and longer each year, all of which works against, insofar as finding a place on the ordinary program is concerned, the rewarding of arduous cinematographic expeditions into jungles and foreign fastnesses and recording the unknown life that is unearthed there. In other words, if we are to have many more ten and eleven reel features, as appears to be the trend of the producers at this time, there will be no room left for even the most meritorious short films of adventure or travel—call them what you will—once the essential news and comedy pictures are taken care of."

### *Historic Trip*

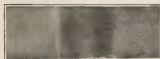
The trip on which Cowling captured the cinematographic material that is now ready for release was one of the most notable ever to be essayed by a cinematographer. It required the better part of two years to complete, and led him over thousands of miles of primitive travel into parts of Africa, India, Tibet and the Orient, which theretofore had been entered by few, if any, white men, and which certainly is now being brought for the first time to the outside world through the medium of Cowling's cameras.

# Rack and Airbell Markings on Cinema Film

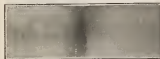
*Causes and Effects of Different Types of Marks Given Thorough Analysis.*

**By J. I. Crabtree  
and C. E. Ives**

*Timely Facts in Eastman Research Laboratory Communication Presented Herewith.*



**TOP OF RACK**



**BOTTOM OF RACK (Fig. 1)**



## KEY TO FIGURES

**Fig. 1**  
*Typical Development Rack Marks on Motion Picture Film.*

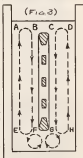
**Fig. 2**  
*Streaks Caused by the Restraining Action of the Products of Development.*

**Fig. 3**  
*Diagram Illustrating the Probable Direction of the Convection Currents in a Motion Picture Developing Tank.*

**Fig. 4**  
*Film Developing Rack With Offset Spacing Pins.*



*Figure 4*



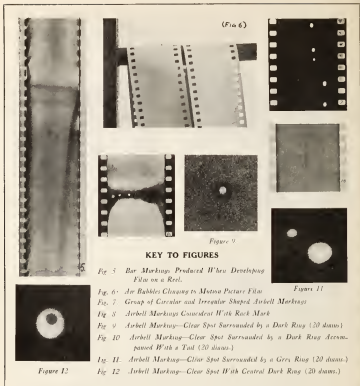
When developing motion picture film by the rack and tank system it is very difficult to secure uniform development throughout the entire length of the film. Unless special precautions are taken, more development occurs at the top and bottom of the rack where the film passes over the end slats or bars than along the sides, so that bands of greater density occur at intervals corresponding with the height of the rack, which cause an objectionable flicker when the film is projected. These dark markings are termed "rack marks."

Another difficulty arises from the cling-

ing of airbells to the film as the rack is immersed in the developer. These airbells prevent the access of developer to the film locally thus causing white spots.

Both the above defects can be overcome by correct manipulation, but their presence on much of the film shown in the present day theatre indicates a need for a better knowledge of the subject on the part of many laboratory workers.

It is the purpose of this article to explain the nature and cause of rack marks and airbell markings on motion picture film and to indicate methods for their prevention.



### KEY TO FIGURES

Fig 5 Bar Markings Produced When Developing Film on a Reel.

Fig. 6 Air Bubbles Clinging to Motion Picture Film

Fig. 7 Group of Circular and Irregular Shaped Airbell Markings

Fig 8 Airbell Markings Coincident With Rack Mark

Fig 9 Airbell Marking—Clear Spot Surrounded by a Dark Ring (20 diam.)

Fig 10 Airbell Marking—Clear Spot Surrounded by a Dark Ring Accompanied With a Tail (20 diam.)

Fig. 11 Airbell Marking—Clear Spot Surrounded by a Grey Ring (20 diam.)

Fig 12 Airbell Marking—Clear Spot With Central Dark Ring (20 diam.)

### RACK MARKS

#### Nature of Rack Marks

When film is developed on the usual rack in a vertical tank, more development invariably occurs where the film passes over the top and bottom of the rack than along the sides causing the film to appear as shown in Fig. 1. The marking where the film passes over the top of the rack is usually mottled and consists of a double line, while at the bottom, only a single dark line is produced

#### Cause of Rack Marks

At various times rack marks have been wrongly attributed to causes such as a difference in temperature between the rack slats and the developer, which might cause an acceleration or retardation of development at the point of contact of the film with the slat. Experiments have been shown however that more development occurs where the film passes over the slats even when the rack is cooled below the temperature of the developer before immersion. It is now known that



rack marks are caused by non-uniform development due to connection currents and retardation of development of the film along the sides of the rack by the developer exhaustion products.

In order to demonstrate the non-uniformity of development at the top and bottom of the rack a length of motion picture film was given a uniform exposure and developed for the normal time, five minutes, at 65° F., the rack being kept stationary. The density of the developed film was measured in several places at the top, middle and bottom of the rack and the average measurements were found to be as follows:

Top of Rack	Middle of Rack	Bottom of Rack
1.32	1.15	1.02

This grading of density from top to bottom of the rack is due to the fact that wherever development occurs, reaction products consisting of oxidized developer and sodium bromide are formed. These substances are strong restrainers of development and have a greater density or specific gravity than the fresh developer, and therefore, tend to flow downward while developer flows from above to take its place. As the developer flows down the vertical film it becomes gradually more and more exhausted because it has assisted in developing the upper portions. This results in a gradual diminution in the degree of development of the film from top to bottom of the rack.

The actual existence of convection currents in a vertical developing tank has been shown by Bullock<sup>1</sup> who placed paper fibres in the solution. During development the fibres were observed to travel downwards along the film and then upwards at the side of the tank.

The restraining effect of the reaction products of development may be very clearly demonstrated by exposing a strip of film through a metal plate punched with a number of holes, slightly flashing the whole film to light and then placing the film vertically in the developer without agitation. Immediately below each black circle which develops up, a white tail is produced as shown in Fig. 2 caused by the restraining effect of the reaction products from the development of the circles, which reaction products gravitate downwards. If the film is wetted before being

placed in the developer the white tails appear above the circles (Fig. 2) because the reaction products diluted with the water absorbed by the film have a lower specific gravity than the developer and, therefore, travel upwards.

The probable direction of the convection currents occurring in a vertical motion picture developer tank is shown in Fig. 3.

The main currents A B F E, and C D H G flow parallel with each side of the rack. At the bottom of the rack small eddy currents probably exist while across the top of the rack the developer remains relatively stationary.

At the points B and C the developer is continually renewed while between these points the reaction products of the developer remain stationary and development is restrained so that a double rack mark is produced as shown in Fig. 1A. At the points F and G, development is restrained by the reaction products flowing down the film, while between these points the developer is being continuously renewed by virtue of the eddy currents so that only a single rack mark results as shown in Fig. 1B.

Negative rack marks appear as light bands on the positive print. The positive film may therefore contain both negative (light bands) and positive (dark bands) rack marks at varying intervals but separated by a distance not greater than the height of the rack. Only in rare instances do the positive and negative rack markings coincide.

Since rack marks are caused by non-uniform development, the remedy is somewhat obvious, but it is very difficult in tank work to ensure that each portion of the film develops at exactly the same rate. To attain this end the developer must be renewed at each point at the same rate and this can be partly effected in the following ways:

1. *By agitation of the developer with the rack remaining stationary.* This can be accomplished by means of a pump or mechanical stirrer, but in the case of a deep tank it is almost impossible to so agitate the developer that the rate of renewal of the developer at the surface of the film is constant throughout its entire length. The experiment was tried of injecting a stream of nitrogen gas (so as not to oxidize the developer) at the bottom of the tank, but unless an even stream of the gas passed up each side of the rack uneven development resulted. In view of the expense involved and the difficulty of securing uniform agitation, this method was abandoned.

<sup>1</sup> On the convection currents in photographic developing tanks, *Journal of the American Institute of Chemical Engineers*, Vol. 1, No. 2, 1925, p. 119.

## The EDITORS' LENS • • focused by FOSTER GOSS

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¶The reception accorded the selection by famous critics of the productions with the best cinematography for the past year, as reported in the last issue of the *American Cinematographer*, has exceeded the most optimistic anticipations. As was intended, that feature of this publication bids fair to stimulate, more than ever, the progress of cinematography.

¶The critics' attention in this matter indicated that they are thoroughly cognizant, if they have given the situation study at all, of the importance of the cinematographer in the scheme of producing motion pictures. To stimulate cinematography is but blazing the way for the proverbial "bigger and better pictures"; and if there has been a Moses to lead motion pictures out of the land of infancy it is motion photography itself.

### Motion Picture Theatres ?

¶The comment of Herford Tynes Cowling, A. S. C., in other columns of this issue, on the current tendency of motion picture theatre programs commends itself to consideration.

¶Early cinema theatre managers made money for their houses and reputations for themselves through the embellishments which they added to the presentations of the features which they exhibited. There have come the atmospheric prologue, symphony orchestras, and a long array of acts which are truly vaudeville, until the patron now at times scarcely knows whether he is in a film theatre or in one of the early variety houses. Certainly many of the acts which clutter up the offerings are of the same vintage as the crudest of variety turns, not to mention many of the "atmospheric prologues," which would be dignified if they were termed even "amateurish prologues."

¶Unfortunately, countless smaller and neighborhood houses have seen fit to emulate the presentations of the larger and better known houses—and the latter, in pursuing their established procedure, have uncurtailed, in too numerous instances, more mediocre than super-

lative programs. What can be expected then of the smaller houses, which, when they get their best talent, are obliged to present what is worse than the big houses' worst—which is bad enough. To tax the tolerance of the patron even more, many of these vaudeville acts, prologues and whatnot are inordinately long (while the same theatre may have insisted on the cutting of the feature's credit titles in order to "save time").

¶We have no quarrel with the intelligent handling of orchestra music, prologues or befitting acts. We believe, however, that progressive theatre managers are open to suggestions. We believe that it is better to bill a short-length motion picture that is interesting (and there are many of them if the manager has not closed his eyes to them), than it is to give time to a doubtful act or a hurried stage presentation that usually must be put on in the minimum of time between the end of the showing of one feature and the beginning of another. While the foregoing may apply principally to the smaller theatres, the impresarios of some of the more pretentious establishments might take note also.

¶Motion picture theatres, after all, take their names from motion pictures!

### No Advance?

¶One who writes spasmodically on cinematography in a Hollywood weekly under the signature of "Sub Rosa" recently opined in an issue that reviews performances of 1925 as follows: "There does not seem to be any advance made photographically in the past year."

¶While we do not know just what period of time the unknown writer includes in "the past year," surely he does not mean to be oblivious to "The Lost World," "The Ten Commandments," "Don Q," "The Thief of Bagdad," "The Wanderer," "Monsieur Beaucaire," etc.?

¶Or, if "Sub Rosa" is the authority on cinematography that he is seemingly set up to be and if he is confining his remarks to the immediate present, is he in total ignorance of the cinematographic strides that are being made in "The Black Pirate"? Perhaps also he is ignorant of R. E. Sherwood's recently published estimation of the cinematographer?

¶It is an unusual year indeed wherein the cinematographer does not contribute materially to the progress of motion pictures!



Al Gilks, A. S. C., has completed the filming of "The Enchanted Hill," which, based on the Peter B. Kync story, was directed by Irvin Willat

\* \* \* \*

Fred W. Ackman, A. S. C., is busy with the editing and titling of his latest production at the Hal Roach studio. Floyd Jackman, A. S. C., was chief cinematographer. It is said that the newest Jackman vehicle surpasses even the highly successful "Black Cyclone."

Reginald Lyons, A. S. C., is back at the Fox studio in Hollywood after a location trip to Bishop, Calif., on the newest Buck Jones feature.

\* \* \* \*

Kenneth MacLean, A. S. C., has finished the filming of special effects on "The Sea Beast," the Warner Bros. production starring John Barrymore.

\* \* \* \*

King Gray, A. S. C., has returned from Portland, Ore., where he was chief cinematographer on the current Lewis H. Moomaw production. The cast included Eugene O'Brien, Virginia Valls, Bryant Washburn and George Nichols.

\* \* \* \*

George Schindlerman, A. S. C., has been away from Hollywood on location for the photographing of his latest William Fox feature.

\* \* \* \*

Henry Sharp, A. S. C., is still hard at work on the cinematography in "The Black Pirate," which Douglas Fairbanks is producing by the Technicolor method of photography.

\* \* \* \*

H. Lyman Broening, A. S. C., when he was recently engaged by Warner Bros. as chief cinematographer on "The Sea Beast," starring John Barrymore, resumed an association that had its origin in 1914 with Famous Players in New York City. The association was with none other than Barrymore himself whom the A. S. C. member photographed in his first starring appearance in films. The picture was "The American Citizen." Two years

later Broening photographed the illustrious Barrymore in "The Lost Bridegroom." Now, as then, Lyman states, "John is 'some' actor."

\* \* \* \*

William Marshall, A. S. C., is photographing "Flaming Waters," an Associated Arts production, which is being directed by F. Harmon Weight.

\* \* \* \*

Victor Milner, A. S. C., has been working on location at Anaheim Landing, where the Pacific meets the California coast, for the filming of important scenes in the latest R. A. Walsh spectacle for Paramount.

\* \* \* \*

## A. S. C. Member's Work Praised By Motion Picture Reviewers

*Following are a number of excerpts as relates to cinematography, compiled for the first time, from the reviews on Mary Pickford's "Dorothy Vernon of Haddon Hall":*

*Edwin Schallert, Los Angeles Times—*

"Amazing photographic attractiveness for which Charles Rosher is to be credited.

"Seldom have I seen anything more enchanting than some of the portraiture; Mary is more alluring than she has ever been.

"You think at times when you view her you are actually seeing Gainsborough coming to life."

*W'id—*

"Artistically it ranks as one of the best films made to date. Photographically, this is one of the most beautiful productions that has ever been screened."

*Photoplay—*

"... exceedingly beautiful pictorially... a new high watermark in animated photography

"Charles Rosher, cinematographer extraordinary, deserves a medal of honor for the photography."

*Illustrated News, Los Angeles—*

"The elegance of both interiors and exteriors is magnified by splendid lighting effects achieved by Charles Rosher, master cinematographer."

*Sunday Pictorial—*

"Beautiful composition and perfect photography make this picture like a series of old masters.

"If there were a Nobel Prize for camera art it would certainly go to Charles Rosher."

*Pearl Ball, Los Angeles Express—*

"To Cameron Charles Rosher belong highest honors for his superlative beauty."

*Picture Play—*

"The photography which gives the beautiful exteriors and vast interiors a tapestried softness is not the least part of the picture. We think Charles Rosher, artist of the lens, one of the most valuable members of the Pickford studios."



*View of New York Institute New Camera.*

## New Camera Introduced by N. Y. Photographic Institute

A new standard camera was announced this month by the New York Institute of Photography. The instrument is designed for light weight and to be marketed at a low price.

The camera, the Institute management states, is made to sell in units. Extra lenses, magazines, turrets and special attachments will be sold separately so that outfits for individual requirements may be assembled from standard parts. With case and magazines of aluminum alloy finished in glossy black enamel, the new camera measures  $6\frac{1}{2}$  inches wide,  $6\frac{1}{2}$  inches high,  $7\frac{3}{4}$  inches long without magazine and 12 inches high with magazine. The weight is  $12\frac{1}{4}$  pounds and the capacity is 200 feet of standard film. There is a direct vision finder.

The lens is a 2-inch, F 5 anastigmat in focussing mount; it is a Cine Velostigmat by Wollensak Optical Co. The shutter is 180-degree non-adjustable. The camera uses the harmonic cam and visible spring belt. The movement is in normal and reverse, with single picture attachment obtainable. A set-back footage meter is built in the case. The camera contains a slot for the use of masks for intricate work.

Various standard camera equipment, it is announced, may be used in conjunction with the camera; the manufacturers list different kinds of accessories for such uses.

## Governor of Virginia Sees A. S. C. Member's Trophies

Governor E. Lee Trinkle of Virginia and Mrs. Trinkle; W. McDonald Lee, commissioner of Inland Game and Fisheries; Col. Parke Deans of Richmond, and other Southern officials were the guests during the past month of Herford Tynes Cowling, A. S. C., at the Cowling family home in Suffolk, Va., where the A. S. C. member personally displayed to his visitors his collection of trophies which he has acquired during his numerous travels to the remote places of the world.

"Governor and Mrs. Trinkle, Col. Parke Deans and others visited the home," a Virginia newspaper reports, "and expressed amazement at the completeness of the collection which has been made by Mr. Cowling through the years.

"Leopard skins, tiger skins, quaint articles of clothing and wood are part of the collection. The trophies are reminders to Mr. Cowling of his thrilling experiences in dense jungles and other hunting grounds.

"Not only were the trophies interesting to the Governor's party but the wealth of information possessed by Mr. Cowling was imparted in such a manner to be both entertaining and instructive. For years Mr. Cowling has been traveling about the world and his articles have been read by many who knew him in the days when he was but a lad in Suffolk."

## Issue Date Changed

Following the lead of the *American Projectionist* and other trade journals which have been issuing at the end of the current month, the *American Cinematographer* hereafter will appear at the first of the month. To effect this schedule, the November number is being issued with the December this month. This will not affect the sequence of issues as all subscriptions and advertisements are automatically advanced one additional month.

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## Projection

(Continued from Page 43)

pressure is quickly applied, the two pieces of film are welded together. When too much or too strong a cement is used, the whole celluloid base is softened, instead of only the surface, causing the film to cup, or buckle, after drying.

**Cause No. 5. Not enough cement or cement in bad condition.** If too little cement is used, it will not soften the celluloid sufficiently to make the splice hold. Film cement evaporates rapidly if left uncorked and will cause the mixture to lose its proper proportions. Cement in this condition will not hold the splice.

**Cause No. 6. Uneven scraping.** It is necessary to remove every particle of emulsion to make a good splice. (See Cause No. 3.) However, great care must be taken not to thin down the celluloid base for the reason stated in Cause No. 4.

Improper tools, careless handling of the film, or dirty hands will also result in poor splices. Covered hands or taped fingers will not permit the best work.

So far this paper has dealt with hand-made splices. Now let us examine some of the results of improperly made splices. The fact that every film passes through two or three different makes of projectors, and that each of the three most widely used makes threads differently from the others, does not make any difference whether the splice is lapped left or right.

## Bad Splices

Certain tests show conclusively that the film invariably runs off at the take up sprocket, and ninety-nine times out of a hundred the run off is caused by a bad splice. The reason for this is that the film at the top sprocket is kept taut by the tension on the reel in the top magazine, and the film is kept taut at the intermittent by the tension at the aperture. The film feeds on to the bottom sprocket out of a loop that is constantly slapping back and forth, and a slight imperfection in a splice will cause the film to run off and become damaged.

Very few projection rooms are properly equipped to splice film, but fairly good splices can be made by hand if sufficient time and pains are taken. However, most splices made in the theatres are made in a hurry.

Not only has a great deal of damage resulted from improperly made splices, but often the presentation of a picture is greatly marred. A bad splice also constitutes a fire hazard. Exhaustive experiments and research have proven conclusively that permanent splices cannot be made by hand.

**First:** It must be narrow enough in width to conform to the periphery of the sprocket wheels.

**Second:** It must be uniformly scraped.

**Third:** It must be in perfect register.

**Fourth:** Cement must be quickly and evenly applied.

**Fifth:** Uniform pressure must be quickly applied.

The answer to this is, to properly splice film, it must be done automatically.

Famous Players-Lasky Corporation have equipped all of their exchanges and laboratories with the Bell & Howell automatic positive splicing machine. This machine automatically cuts and scrapes film and applies even pressure to the splice. The plates on which the splices are made are heated to about 120 degrees. The heat not only acts as a binder to the cement, but makes it quick drying.

It certainly is the duty of exchanges to properly inspect and splice the film served to the theatres. It is also the duty of the projectionist to make as good splices as possible, and a little more thought and pains on the part of the projectionist in making splices will greatly add to the life of the film and re-act in better service from the exchanges.

## Roos Returns From Trans-Pacific Trip

Len H. Roos, A. S. C., has returned to his headquarters in Vancouver from the Antipodes, where he has been sojourning, cinematographically, for the past several months.

Roos, it is said, is conducting preparations for another trip that is to begin with the first of the coming year. The A. S. C. member is affiliated with the Fox Varieties and News Division.

## Demonstrate New DeVry Model Before A. S. C. Open Meeting

The new DeVry standard portable camera and the DeVry projector, together with the film projected thereon, were demonstrated to the members of the American Society of Cinematographers by H. A. DeVry, the inventor and president of The DeVry Corporation of Chicago, in the auditorium of the Society on the evening of November 16th. Nearly two-score guests of the society, representing practically every branch of the film industry, also were present, the demonstration arousing great interest.

Mr. DeVry was introduced to the members of the society and their guests by Mr. Homer Scott, president of the organization. After a brief outline of his former activities which included service with the foremost camera manufacturers in the world, extending over a period of thirty years, Mr. DeVry outlined the features of his invention.

"The DeVry automatic movie camera," he said, "has no tripod and does not have to be cranked. All you do is press the button, the camera does the rest. It is extremely light, weighing but 8½ pounds. It is a real camera for the professional as well as the amateur.

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After a very satisfactory demonstration of the DeVry projector, an interesting program of entertainment was offered together with refreshments.

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## Rack and Airbell Markings

(Continued from Page 16)

2. *By agitation of the rack.* The rack can be agitated in the following ways:

(a) By lifting the rack vertically out of the developer and reimmersing. This is the only method of agitation possible if the tank is fitted with rack guides. The rack is normally held down under the solution by a suitable fastener but on releasing this, the rack tends to float and usually protrudes about half way out of the tank. If the rack is again submerged this will produce sufficient agitation to replace the reaction products of development at the surface of the film with fresh developer, and mix the developer as a whole so as to be more nearly homogeneous.

The question arises as to how often agitation is necessary. The process of lifting and reimmersing the rack in a vertical direction causes a strong current of developer to strike against the lower slot which tends to produce more development at that point and accentuate the rack marks. Experience has shown that agitation of the rack by allowing it to rise out of the developer and immediately reimmersing once every minute produces an effective degree of agitation of the developer.

(b) By leaving the rack fully immersed and imparting to it a "square motion," that is, the rack is moved horizontally across the tank away from the operator then vertically downwards, then across the tank towards the operator and then vertically upwards. This manipulation may be termed the "square motion" and is only possible if the tank does not contain rack guides and if the depth of the



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liquid is somewhat greater than the height of the rack. Experience has shown that the rack must be agitated almost continuously in this manner in order to produce effective agitation, but this is not practical and in case the film is developed by time it is difficult to duplicate the degree of agitation.

3. By moving the film along the rack during development. This can be effected in two ways:

(a) By winding the film on a roller rack previously described<sup>2</sup> which consists essentially of a regulation rack with the end slats replaced by rollers. By attaching the film at each end to the rollers by means of rubber bands and turning the upper roller during development, the film is progressed along the rack spirally and any unevenness of development at the roller end is distributed over the film for a length of two or three feet and rack marks are, therefore, effectively prevented. When using such a rack it is desirable to agitate the developer by lifting the rack out and reimmersing once every two minutes. Owing to its relatively higher cost and the extra time required to load such a rack it has not been generally adopted, though as a means of preventing rack marks it is highly effective.

(b) By progressing the film along the rack manually. This is accomplished by attaching the film at each end by means of a long rubber band capable of being stretched two or three feet. The same procedure is then followed as when tightening the film after winding on the rack, although this is carried out while the rack is completely immersed under the developer. By advancing the film spirally in this way every two minutes fairly even development is obtained.

This procedure requires the undivided attention of the operator and is otherwise objectionable but is the only alternative manipulation to the roller rack method for completely eliminating rack marks.

4. By making the end slats of the rack as broad as possible and with a curved surface. This has the double effect of producing better stirring of the developer on agitation of the rack and of broadening out the rack marks. Experience has shown that a broad rack mark which grades off gradually at each side is less objectionable on projection than an extremely narrow one produced by a V-shaped end slat. It has been found that cylindrical end slats having a diameter of about

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<sup>2</sup> "The Development of Motion Picture Film by the Roll and Tank Methods," by J. J. Crabtree, Texas & M. P. R. Vol. 10, p. 146.

two inches as shown in Fig. 4 are the most satisfactory and practical.

The following experiment was also tried. Strips of wood two inches wide were attached by means of clips across each end of the regulation narrow slot rack to provide an efficient means of stirring and to protect the ends of the rack from an excessive flow of developer when the rack was agitated. Though moderately effective in diminishing the intensity of the rack marks, better results were obtained with the cylindrical slats.

5. *By developing as far as possible to completion* As explained above, since rack marks are produced by virtue of one portion of the film receiving more development than another, it follows that the propensity for rack marks to be produced is greater when the film is developed to a low degree of contrast than when the limiting contrast is attained. In other words, with a fully exposed positive, printed from a contrasty negative, which must be developed in a weak developer for a short time, there will be a greater propensity for rack marks to be produced than in the case of a print from a flat negative which must be developed to the limit. The matter of the degree of development of any rack of film is, of course, determined by the requirements of photographic quality. Special care, however, must be taken when developing to a low degree of contrast.

#### *Practical Instructions for Preventing Rack Marks*

By employing racks with cylindrical slats of approximately two inches in diameter as shown in Fig. 4, allowing the rack to emerge from the developer and immediately reim-

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immersing once every minute during the course of development, both negative and positive rack marks are so effectually eliminated as to be practically invisible on the screen.

For precision work, when more absolute uniformity of development is desired, either the roller rack should be employed and the rack agitated once every minute, or the film should be progressed along the rack manually as explained above.

It should also be remembered that full development of the positive or negative tends to eliminate rack marks, and although the degree of development is determined by the requirements of photographic quality, it is desirable not to over develop the negative in order to eliminate the necessity of giving an extremely short development of the positive which is necessary with a contrasty negative.

#### *Fixing Bath Rack Marks*

Rack marks may be produced independently in the fixing bath if the rack is not agitated, especially during the first few minutes of fixation. Owing to the fact that the film is saturated with developer when immersed in the fixing bath, the film continues to be developed, especially in a fixing bath which is weakly acid, until all the alkali in the developer is neutralized by the acid in the fixing bath. If the rack is not agitated, the rate of neutralization of the developer takes place more slowly at the top and bottom of the rack because of vertical convection currents along the sides of the rack as outlined above under development, so that the film continues to develop locally, causing rack marks. To prevent this, the rack should be agitated several times on first immersing in the fixing bath so as to ensure complete neutralization of the alkali in the developer, thus arresting development.

#### *Toning Rack Marks*

When toning film on a rack in a single solution toner such as a uranium or iron toning bath, it is extremely difficult to obtain



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uniform toning especially if only a weak tone is desired. In the case of sulphide toning, when the bleaching and sulphiding processes are carried to completion no difficulty is encountered, but with the above toning solutions toning is progressive with time and for the same reason as outlined under development, there is less tendency for rack marks to form the nearer the degree of toning is carried to completion.

Any rack mark already present due to development will also be intensified in toning and unless guarded against new rack marks will be produced during toning.

It has been found that the procedure of raising the rack out of the solution every minute is not sufficient to prevent toning rack marks. In addition, it is necessary either to use a roller rack or progress the film along the rack manually. The following procedure is recommended:

(a) Use a roller rack or one with two-inch cylindrical slats as for development.

(b) Attach the ends of the film by means of rubber bands sufficiently long to give and take through a distance equal to about  $\frac{3}{4}$  of the rack height.

(c) After immersion, stretch the band at one end and feed the film back spirally from the other end in steps of four to six inches every two minutes in a manner as outlined under development.

Even with the above procedure, slight toning for a short time is not possible. Toning should be carried out for at least one quarter of the time required for toning to the limit.

In view of the fact that both the uranium and iron toned images are partly soluble in alkali, if the water is at all alkaline uneven washing may cause local reduction of the toned image which results in unevenness. This may be prevented either by progressing the film along the rack during washing, or by washing by means of successive soaking in water weakly acidified with acetic acid.

#### *Reel Bar Marks*

When developing on a reel, bar marks or slat marks are invariably produced at or near the point where the film passes over the slat or bar. This is because the slats act as paddles to agitate the developer and the impact of the developer against the film is greatest at or near the slats, so that the developer is renewed most rapidly at these points resulting in an increased rate of development.

Curved markings as shown clearly in



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Fig. 5 are also produced as a result of curling of the film between the bars which causes the developer to flow more or less in specific channels.

Reel bar marks may be minimized by using a reel with as many slats as possible so that the cross section approximates to a circle, by avoiding rapid rotation of the reel, and by reversing the direction of rotation of the reel at intervals.

### *Airbells*

When a strip of motion picture film is immersed in a developer or other solution there is always a tendency for more or less air to be carried along with the film under the solution where it immediately tends to assume a spherical shape resulting in a so-called airbell. See Fig. 6. The bubble of air usually clings to the film throughout the course of development unless for some reason it is dislodged, and it prevents access of the developer so that on subsequent fixation a clear spot or airbell marking remains. Sometimes the airbell persists throughout fixation or is formed again on immersion of the film in the fixing bath so that after washing a spot of unfixed out emulsion remains.

Clear airbell markings produced on negative film appear as dark spots on the positive, and in view of the present practice of developing negative film on racks and positive film on processing machines, which do not have so great a tendency to give airbells, most airbell markings seen on the screen at the present time are dark spots caused by airbells on the negative.

### *Shape and Configuration of Airbell Markings*

At the moment of formation the airbell is usually hemispherical and has a relatively large area of contact with the film; but owing to the tendency of the airbell to assume a spherical shape the area of contact with the film tends to become very much smaller. As the area of the circle of contact diminishes due to this change in shape, the emulsion previously protected becomes partially developed, which results in a clear spot corresponding in size to the area of contact of the final airbell, surrounded by a dark ring of lighter density than the surrounding area.

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## Photographing in Alaska

(Continued from Page 22)

thousands of acres in the Alaskan islands for the purpose of raising fur bearing animals. The islands are best suited for this because natural barriers prevent escape, at the same time enabling the animals to run free and in the main to feed themselves. Blue foxes are most prolific near Sitka. Each pelt brings approximately \$250.

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Following clear days of bright sunlight, it was the experience of the company in and near Sitka that a high fog would bank the skies in the late afternoon, but every scene was reported perfectly recorded by the use of super-speed film and very high speed lens equipment.

### Rare Shots

On two nights the Northern Lights were witnessed and one of the sequences was photographed with that effect. Scenes were also photographed at one of the several active glaciers near Juneau. Considering what was expected, comparatively little snow was found at the end of summer and the filming of the picture will dispel the ideas of many people regarding Alaska being a land of perpetual ice and snow.

### Virgin Field

Alaska, however, is undoubtedly the land of unlimited picture material with thousands of beautiful locations and no company within a short space of time could more than skim its possibilities from a standpoint of cinematography.

## Ira Morgan, A. S. C., in New Contract

Ira H. Morgan, A. S. C., has just signed a contract which marks his sixth year as chief cinematographer for Marion Davies with whom he has been associated on her most important productions.

Film direction has begun on Miss Davies' spectacular new vehicle, "Beverly of Graustark," Cosmopolitan's production of the famous George Barr McCutcheon novel of the same name, and which is to be Morgan's first effort under the new contract.

Under the direction of Sydney Franklin, preliminary scenes are being filmed with large and colorful crowds representing court attendants, officers and soldiers on a huge



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With her hair cut short Miss Davies wears a military uniform, and abandons all hints of feminine makeup, actually adopting male makeup methods

## Cinematographer Becomes Actor

Maurice Kains, former second cinematographer, who wanted to be a screen star not for fame, but to locate his lost mother, has been given his big chance.

Kains will play one of the principal roles in "The Torrent," forthcoming Cosmopolitan production of the famous Vicente Blasco Ibanez novel, in which Greta Garbo, famous Swedish screen star, will make her American debut.

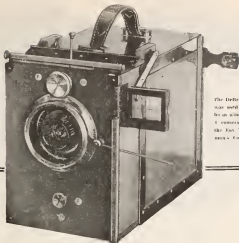
Kains applied at the Metro-Goldwyn-Mayer studios some

time ago, seeking to be an actor, and, failing to achieve this, obtained a position as assistant cameraman.

Henrik Sartov, Lillian Gish's cinematographer, was testing a lens one day, and used Kains as his subject. Louis B. Mayer saw the test film and was taken with the appearance of the young cinematographer so questioned him.

Kains said he wanted to be an actor, not for fame, but to find his mother. While he was in the navy she moved from her New York home, he said, and their letters had gone astray. He thinks if his face appears on the screen she may see him, and get in touch with him through the studio.





The DeBrie "Interview" is most exclusively by the staff of the International News Reel Corporation. Photo, Press and Kinograms also use the DeBrie. What more need be said?

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THIS is the Camera that every Newspaper Cameraman hopes some day to own. It is a highly scientific instrument, refined to the last degree in perfection of detail and developed with particular thought toward the important matter of simplification. Anyone can operate it with the assurance of good results.

The light weight of the DeBrie "Interview" (only 14 pounds) makes it an extremely portable outfit. Camera measures 8 inches high, 10 inches long, 6 inches wide. It carries the regular DeBrie magazine, holding 400 feet of film. Five ply walnut body withstands all climatic changes.

Footage dial at rear indicates the total number of feet of film. Magnifying focus tube shows subject right side up, full aperture, assuring positive focus.

Two-inch F3.5 high grade anastigmat lens. Two 400-foot magazines and sole leather carrying case.

There are attached a focusing rod and diaphragm rod which can be regulated from the rear of the camera while taking pictures. Behind the focusing and diaphragm rods are bars on which can be engraved distances and diaphragm openings for four different lenses.

Quick lens-changing device. Film can be reversed. Film punch to mark scenes. Stop motion crank. Clips to hold front up while threading. Takes DeBrie Standard sunshade, DeBrie Iris, or any standard Iris can be fitted.

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**110 West 32nd Street** **NEW YORK**

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THE BELL & HOWELL  
CORPORATION

Sept  
20th  
1925

Mr. G. B. Richards,  
Bell and Howell Company,  
6384 Santa Monica Blvd.,  
Hollywood, Calif.

My dear Mr. Richards:

The Bell and Howell Camera has been used in my service for several years with very satisfactory results. Your camera was one of the best in the field and I feel it has kept pace with the remarkable expansion and development which has taken place on the photographic side. There are several Bell and Howell cameras in our organization which are like very old friends to me - I have looked through their finders so many hundreds of times!

Yours truly

Carl B. de Wille

# HOW TO LOCATE MEMBERS OF THE American Society of Cinematographers

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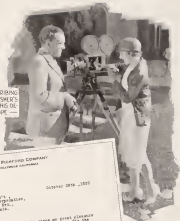
Meetings of the American Society of Cinematographers are held every Monday morning. On the first and the third Monday of each month the main meeting is held, and on the second and the fourth the meeting of the Board of Governors is held. Meetings are held at the Hollywood Hotel, Hollywood, California.

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MISS PICKFORD INSCRIBING  
MEMENTO IN MR ROSHER'S  
CAMERA ON EVE OF HIS DE-  
PARTURE FOR EUROPE —



MARY PICKFORD COMPANY  
HOLLYWOOD, CALIFORNIA

OCTOBER 28th., 1925

Mr. A. F. Seeger, Pres't.,  
Universal Camera Corporation,  
4525 Maple Street Bldg.,  
Hollywood, California.

Dear Mr. Seeger:

At this time it gives me great pleasure  
in writing you and expressing my appreciation for the  
great assistance the Universal Camera has given me in my  
work during the last three years, in photographing such  
pictures as "Foolish", "Smoking Room", "Little Annie Rooney"  
and "Hurricane".

The growing friendship between us the  
gradual opportunity to study sophisticated equipment,  
which we of such importance in the success of correct  
photography.

The operations necessary from the first  
step up to the "ready for action" stage, and reduced to a  
minimum, and the work with which they are performed, are  
a great asset. They become automatic, making the work  
easy to concentrate on the lighting and composition of  
the picture.

After me to say that I think so much of  
the Universal, that I am taking a new outfit with me to  
Europe, to be used in photographing such big things, in  
the big studios, in Berlin.

Wishing you much success, permit me to be

truly,

Sincerely yours,

*Charles Rosher*